Cervical Spine and Airway issues

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Case Presentation

- 49 y/o Male (82 kg, 182cm, BMI 24)
- Surgery: Anterior cervical discectomy and fusion (ACDF) for cervical radiculopathy at level C 5 and C 6 due to stenosis of central canal and both foramina
- Co-morbidities – Hypertension (well controlled with Beta-Blocker)
- Excellent functional capacity (swims 6 days a week)
- Airway exam – Mallampati 1, adequate mouth opening, 4 cm thyromental distance, full range of neck motion w/o worsening of radiculopathic pain
Which intubation technique causes the least cervical spine movement?

1. Asleep Fiberoptic intubation
2. Videolaryngoscopic intubation
3. Intubating Laryngeal Mask
4. Direct laryngoscopy
Sorry – I disagree

Try again
CORRECT!!
The crux for upper airway management for cervical spine surgery is to keep the neck in a neutral position with minimal movement during intubation.

DL may not be suitable in cases of cervical myelopathy and instability.

Manual inline stabilization can impair glottic view and increase subluxation.

Cervical spine movement during VL may be less than with DL.

FOB intubation allows minimal neck movement and may be preferable for airway management during cervical spine surgery.
The great majority of Cervical Spinal Cord Injuries occurred in the Absence of:

- Trauma
- Cervical Spine Instability
- Airway Management Problems

Instead, injuries were associated with:

- Cervical Spine Surgery
- Sitting Procedures
- Cervical Spondylosis
Emergency develops

- EtCO2 tracing is suddenly lost
- FiO2 increased to 100%
- Manual ventilation, bag filled adequately with O2 flush
- Check all circuit connections – all intact
- Surgeons informed; Surgery stopped
What is NOT a differential diagnosis for a drop in EtCO2?

- Decreased Cardiac Output
- Bronchospasm
- Mainstem intubation
- Extubation
- Malignant Hyperthermia
Sorry – I disagree

Try again
EtCO₂ dropped to zero
Oxygen Saturation remained at 100% with
Increase in FiO₂ to 91%
Lost EtCO2 Differential Diagnosis

EKG shows unchanged Sinus Bradycardia
   Cardiac event less likely

Airway Pressures are unchanged
   Kinked ETT, Bronchospasm and Mainstem Intubation unlikely

Accidental Extubation?
What is the best approximation of ETT movement between maximal neck flexion and extension?

- 2cm
- 4cm
- unpredictable
- 6cm
- 8cm
Sorry – I disagree

Try again
CORRECT !!
Head and Neck Movements and ETT displacement

- Head flexion most often leads to ETT advancement towards carina
- Head extension mostly leads to ETT movement away from Carina
- The displacement amount is unpredictable
- Range can be movements in both directions (in and out) for flexion and extension
- Lateral head movement causes even more unpredictable ETT displacement
- Reassessment of ETT position should be mandatory after head positioning
Cervical Spine movement with flexion and extension in our patient
C-ARM image of ETT prior to airway emergency
At what level is the tip of the ETT?

- Vocal cords
- Hyoid bone
- C4
- Cricoid Cartilage
- Carina
Sorry – I disagree

Try again
CORRECT!!
Anatomic Relationships

<table>
<thead>
<tr>
<th>Anatomic Relationship</th>
<th>Spinal Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epiglottis</td>
<td>C2/3</td>
</tr>
<tr>
<td>Vocal cords</td>
<td>C4/5</td>
</tr>
<tr>
<td>Cricoid Cartilage</td>
<td>C6/7</td>
</tr>
<tr>
<td>Carina</td>
<td>T4/5</td>
</tr>
</tbody>
</table>
Management

- Surgeons staple sterile sheet on open neck
- Pull down drape
  - ETT now at 21 cms at the teeth
- Direct laryngoscopy
  - Hyperinflated cuff visualised
- Accidental extubation confirmed
- 08:31 ETT withdrawn
  - Reintubated using glidescope
- Fixed at 24 cm at teeth
- No postoperative sequelae